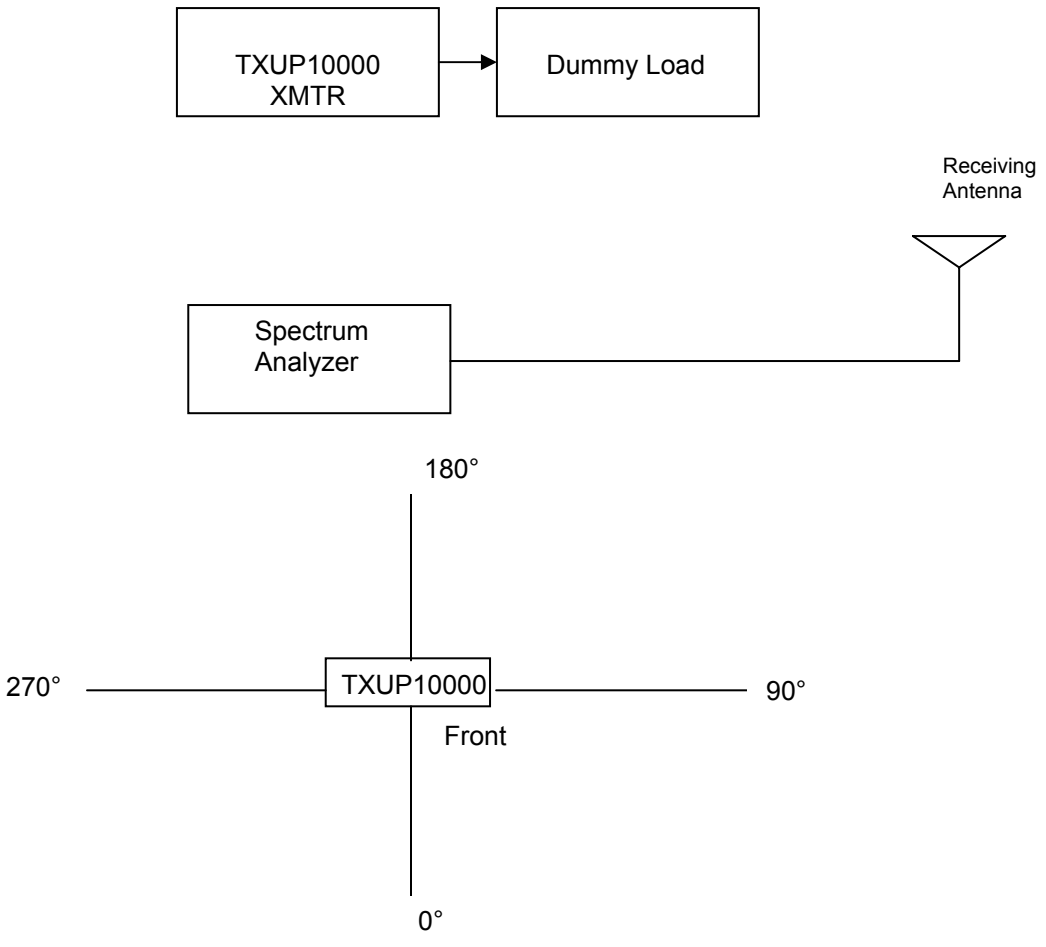
CABINET RADIATION

The transmitter and test equipment were configured as shown below including the angles of measurement with respect to the transmitter cabinet. The photo on the subsequent page also shows one view of the physical set-up of the test equipment and equipment under test. The transmitter was operated at 10000 watts peak sync power with a 10 dB visual/aural ratio with the video input signal being a Modulated Stairstep signal. In this case the fundamental frequency was set to 801 MHz because there was interference on 567 MHz. The free space path loss and antenna gain characteristics were obtained at the fundamental frequency and at each of the harmonics of the visual carrier frequency in order to accurately assess the level of the signal radiated from the cabinet. Radiation from the cabinet was measured with 4 different physical rotation angles: 0, 90, 180, and 270 degrees (0 degrees being the front of the cabinet). All spectral components above -80 dB referenced to peak sync power radiated from the cabinet were recorded. The values are tabulated in the table on the next page following the photos.

TEST EQUIPMENT CONFIGURATION



As indicated in the spreadsheet data, the worst case calculation was 79.6 dB at the tenth harmonic. The main limitation is the noise floor of the spectrum analyzer. The measurement tables for the all views of the transmitter at each frequency are shown below. The results indicate that all radiated harmonics meet the FCC requirement of 60 dB as outlined in FCC rule 2.1053 and 2.1057.

CABINET RADIATION DATA

TXUP10000 10 KW CABINET RADIATION SPREADSHEET
10 KW Front View
10 kW = 70 dBm
Corrected level must be less than 10dBm
Distance is 30 feet

Harmonic	Frequency MHz	Measured Level	Cable Loss	Antenna Gain	Path Loss	Corrected Level	Required Level	Comparison to transmit level dB	
Xmit freq.	801.25	-40	0.9	7.3	49.8	3.4	10 dBm	66.4	
2nd	1602.5	-62	1.5	6.8	55.8	-11.5	10 dBm	81.5	
3rd	2403.75	-72	1.8	7.3	59.3	-18.2	10 dBm	88.2	
4th	3205	-80	2.2	6.1	61.9	-22	10 dBm	92	
5th	4006.25	-85	2.6	6.6	63.7	-25.3	10 dBm	95.3	
6th	4807.5	-88	3.1	6.7	65.3	-26.3	10 dBm	96.3	
7th	5608.75	-90	3.7	7.3	66.7	-26.9	10 dBm	96.9	
8th	6410	-90	4.1	6.2	67.8	-24.3	10 dBm	94.3	
9th	7211.25	-80	4.6	4.6	68.8	-11.2	10 dBm	81.2	Noise floor changes
10th	8012.5	-80	5.2	4.6	69.8	-9.6	10 dBm	79.6	Noise floor changes

NOTES:

Antenna	AH SYSTEMS SAS-510-7 S/N 118	CAL 1-11-06
Spectrum Analyzer	HP 8593E S/N No #	
Cable	RG213, 12 foot length	
Load	BIRD 8932-115 S/N 1399	
XMTR	TXUP1500	
Video Source	Tektronix 1910 S/N B010833 (color bars)	

Aural Carrier =-10 dB
Spectrum analyzer RBW 100 kHz VBW 10kHz
Exciter is VEGA

Note: The spectrum analyzer noise floor reduced 10 dB for data at the 9^{th} and 10^{th} harmonics. This is why the figures are higher than the figures at the previous harmonics.

TXUP10000 10 KW CABINET RADIATION SPREADSHEET

10 KW Left side View

10 kW = 70 dBm

Corrected level must be less than 10dBm

Distance is 30 feet

Harmonic	Frequency MHz	Measured Level	Cable Loss	Antenna Gain	Path Loss	Corrected Level	Required Level	Comparison to transmit level dB	
Xmit freq.	801.25	-40	0.9	7.3	49.8	3.4	10 dBm	66.6	
2nd	1602.5	-63	1.5	6.8	55.8	-12.5	10 dBm	82.5	
3rd	2403.75	-80	1.8	7.3	59.3	-26.2	10 dBm	96.2	
4th	3205	-86	2.2	6.1	61.9	-28	10 dBm	98	
5th	4006.25	-90	2.6	6.6	63.7	-30.3	10 dBm	100.3	
6th	4807.5	-90	3.1	6.7	65.3	-28.3	10 dBm	98.3	
7th	5608.75	-90	3.7	7.3	66.7	-26.9	10 dBm	96.9	
8th	6410	-90	4.1	6.2	67.8	-24.3	10 dBm	94.3	
9th	7211.25	-80	4.6	4.6	68.8	-11.2	10 dBm	81.2	Noise floor changes
10th	8012.5	-80	5.2	4.6	69.8	-9.6	10 dBm	79.6	Noise floor changes

Note: The spectrum analyzer noise floor reduced 10 dB for data at the 9th and 10th harmonics.
This is why the figures are higher than the figures at the previous harmonics.

TXUP10000 10 KW CABINET RADIATION SPREADSHEET

10 KW Rightside View

10 kW = 70 dBm

Corrected level must be less than 10dBm

Distance is 30 feet

Harmonic	Frequency MHz	Measured Level	Cable Loss	Antenna Gain	Path Loss	Corrected Level	Required Level	Comparison to transmit level dB	
Xmit freq.	801.25	-45	0.9	7.3	49.8	-1.6	10 dBm	71.6	
2nd	1602.5	-65	1.5	6.8	55.8	-14.5	10 dBm	84.5	
3rd	2403.75	-78	1.8	7.3	59.3	-24.2	10 dBm	94.2	
4th	3205	-80	2.2	6.1	61.9	-22	10 dBm	92	
5th	4006.25	-80	2.6	6.6	63.7	-20.3	10 dBm	90.3	
6th	4807.5	-84	3.1	6.7	65.3	-22.3	10 dBm	92.3	
7th	5608.75	-90	3.7	7.3	66.7	-26.9	10 dBm	96.9	
8th	6410	-90	4.1	6.2	67.8	-24.3	10 dBm	94.3	
9th	7211.25	-80	4.6	4.6	68.8	-11.2	10 dBm	81.2	Noise floor changes
10th	8012.5	-80	5.2	4.6	69.8	-9.6	10 dBm	79.6	Noise floor changes

Note: The spectrum analyzer noise floor reduced 10 dB for data at the 9th and 10th harmonics.
This is why the figures are higher than the figures at the previous harmonics.

TXUP10000 10 KW CABINET RADIATION SPREADSHEET

10 KW Back side View

10 kW = 70 dBm

Corrected level must be less than 10dBm

Distance is 30 feet

Harmonic	Frequency MHz	Measured Level	Cable Loss	Antenna Gain	Path Loss	Corrected Level	Required Level	Comparison to transmit level dB	
Xmit freq.	801.25	-39	0.9	7.3	49.8	4.4	10 dBm	65.6	
2nd	1602.5	-70	1.5	6.8	55.8	-19.5	10 dBm	89.5	
3rd	2403.75	-80	1.8	7.3	59.3	-26.2	10 dBm	96.2	
4th	3205	-87	2.2	6.1	61.9	-29	10 dBm	99	
5th	4006.25	-90	2.6	6.6	63.7	-30.3	10 dBm	100.3	
6th	4807.5	-90	3.1	6.7	65.3	-28.3	10 dBm	98.3	
7th	5608.75	-90	3.7	7.3	66.7	-26.9	10 dBm	96.9	
8th	6410	-90	4.1	6.2	67.8	-24.3	10 dBm	94.3	
9th	7211.25	-80	4.6	4.6	68.8	-11.2	10 dBm	81.2	Noise floor changes
10th	8012.5	-80	5.2	4.6	69.8	-9.6	10 dBm	79.6	Noise floor changes

Note: The spectrum analyzer noise floor reduced 10 dB for data at the 9^{th} and 10^{th} harmonics.
This is why the figures are higher than the figures at the previous harmonics.

VOLTAGES AND CURRENTS TO FINAL AMPLIFIERS

Final amplifier DC voltage and current measurements were made with the transmitter operating at 10000 Watts power output and at 2500 watts power output. A video input signal of sync and 0 IRE “setup” level was used. The aural carrier was energized and adjusted for the proper 10 dB Visual to Aural power ratio. Voltage and current measurements were made at the transmitter.

Peak Output Power = 10000 Watts
Voltage = 32 volts
Total DC Current = 64X10= 640 amps
Final amplifier DC power input = 32 x 640 = 20480 watts

Peak Output Power = 2500 Watts
Voltage = 32 volts
Total DC Current = 224 amps
Final amplifier DC power input = 32 x 224 = 7168 watts

EQUIPMENT LIST

The following test equipment was used in the various test equipment configurations or to create calibration of equipment at various frequencies. All equipment was known to be in good working order and the equipment was within the calibration period.

Type	Manufacturer	Model	Date of Calibration	Calibration Expired
Spectrum Analyzer	Advantest	R3132	11/11/05	11/11/06
Signal Generator Platform	Tektronix	TG2000	15/05/05	15/05/06
Video Measurement Set	Tektronix	VM700A	09/01/06	09/01/07
TV Test Receiver	Rohde&Schwarz	EFA	15/05/05	15/05/06
Selective Modulation Analyzer	Rohde&Schwarz	FMAS	02/04/05	02/04/06
Wattmeter	BIRD	4391	02/04/05	02/04/06
Attenuator	Elettronika	N/A		
Dummy Load 100W	Elettronika	N/A		